

Attorney Docket No.: 0190131
Application Serial No.: 09/816,038

In the Claims:

Claim 1 (currently amended): A method of adjusting image lighting, the method comprising:

- generating a preparatory light for a predetermined preparatory duration;
- capturing a ~~single~~ preparatory image while generating the preparatory light, wherein the ~~single~~ preparatory image is represented by preparatory image data;
- determining an average preparatory image luminance of the ~~single~~ preparatory image based on the preparatory image data and weighting at least a subset of the preparatory image data; and
- generating a supplemental strobe duration based on the average preparatory image luminance and luminance weightings; and
- generating a look-up table storing associated image strobe durations and power values including a preparatory image strobe duration and associated preparatory power value.

Claim 2 (previously presented): The method of claim 1 wherein the generating the supplemental strobe duration further comprises:

- generating average block luminances for subsets of the preparatory image data;
- applying the luminance weightings to at least a subset of the average block luminances to generate weighted average block luminance; and
- determining the average image luminance based on the weighted average block luminance.

Attorney Docket No.: 0190131
Application Serial No.: 09/816,038

Claim 3 (original): The method of claim 2 wherein the luminance weightings are stored in a weighting table, and the applying further comprises:

accessing the weighting table to retrieve respective luminance weightings corresponding to portions of the preparatory image; and

multiplying the average block luminance by the respective luminance weightings to provide the average weighted block luminance.

Claim 4 (currently amended): The method of claim 1, further comprising:

~~generating a look-up table storing associated image strobe durations and power values including a preparatory image strobe duration and associated preparatory power value;~~

generating an adjustment factor by dividing a predetermined target luminance by the average image luminance;

multiplying the preparatory luminance power value by the adjustment factor to generate a target luminance power value; and

identifying, in the look-up table, an identified strobe duration corresponding to the target luminance power value, the identified strobe duration being the supplemental strobe duration.

Claim 5 (currently amended): The method of claim 1, wherein generating the supplemental strobe duration further comprises:

~~generating a look-up table storing associated image strobe durations and luminance power values including a preparatory image strobe duration and a preparatory power value;~~

Attorney Docket No.: 0190131
Application Serial No.: 09/816,038

generating a light adjustment factor by dividing a predetermined target luminance by the average image luminance;

multiplying the preparatory power value by the light adjustment factor to generate a target look-up table power value;

identifying, from the look-up table, first and second look-up table power values that are greater and less than, respectively, the target look-up table power value, the first and second look-up table power values having associated first and second image strobe durations; and

generating a final image strobe duration by interpolating the first and second image strobe durations in accordance with the target look-up table power value.

Claim 6 (currently amended): The method of claim 1 further comprising:

~~generating a look-up table storing associated image strobe durations and luminance power values including a preparatory image strobe duration and a preparatory power value; and~~
accessing the look-up table based on the average image luminance.

Claim 7 (currently amended): A signal bearing media having machine readable instructions for adjusting image lighting, the signal bearing media comprising:

a first set of machine readable instructions for acquiring a ~~single~~ preparatory image while generating a preparatory light for a predetermined preparatory duration;

a second set of machine readable instructions for determining an average preparatory image luminance based on preparatory image data associated with the ~~single~~ preparatory image and weighting at least a subset of the preparatory image data; and

Attorney Docket No.: 0190131
Application Serial No.: 09/816,038

a third set of machine readable instructions for generating a supplemental strobe duration based on the average preparatory image luminance and luminance weightings; and

a set of machine readable instructions for generating a look-up table that stores associated image strobe durations and power values including a preparatory image strobe duration and an associated preparatory power value.

Claim 8 (original): The signal bearing media of claim 7, wherein the machine readable instructions that generate the supplemental strobe duration further include:

a fourth set of machine readable instructions for generating average block luminances for subsets of the preparatory image data;

a fifth set of machine readable instructions applying the luminance weightings to at least a subset of the average block luminances to generate weighted average block luminance; and

a sixth set of machine readable instructions for determining the average image luminance based on the weighted average block luminance.

Claim 9 (original): The signal bearing media of claim 8, further comprising:

a seventh set of machine readable instructions for storing the luminance weightings in a weighting table;

a eighth set of machine readable instructions for accessing the weighting table to retrieve respective luminance weightings corresponding to portions of the preparatory image; and

a ninth set of machine readable instructions for multiplying the average block luminance by the respective luminance weightings to provide the average weighted block luminance.

Attorney Docket No.: 0190131
Application Serial No.: 09/816,038

Claim 10 (currently amended): The signal bearing media of claim 7, further comprising machine readable instructions that include:

~~a tenth set of machine readable instructions for generating a look-up table that stores associated image strobe durations and power values including a preparatory image strobe duration and an associated preparatory power value;~~

an eleventh set of machine readable instructions for multiplying the preparatory luminance power value by the adjustment factor to generate a target luminance power value; and

a twelfth set of machine readable instructions for identifying, in the look-up table, an identified strobe duration corresponding to the target luminance power value, the identified strobe duration being the supplemental strobe duration.

Claim 11 (currently amended): The signal bearing media of claim 7, further comprising:

~~a thirteenth set of machine readable instructions for generating a look-up table that stores associated image strobe durations and luminance power values including a preparatory image strobe duration and a preparatory power value;~~

a fourteenth set of machine readable instructions for generating a light adjustment factor by dividing a predetermined target luminance by the average image luminance;

a fifteenth set of machine readable instructions for multiplying the preparatory power value by the light adjustment factor to generate a target look-up table power value;

Attorney Docket No.: 0190131
Application Serial No.: 09/816,038

a sixteenth set of machine readable instructions for identifying, from the look-up table, first and second look-up power values that are greater and less than, respectively, the target look-up table power value, the first and second look-up table power values having associated first and second image strobe durations; and

a seventeenth set of machine readable instructions for generating a final image strobe duration by interpolating the first and second image strobe durations in accordance with the target look-up table power value.

Claim 12 (currently amended): The signal bearing media of claim 7, ~~further comprising a eighteenth set of machine readable instructions for generating a look-up table that store associated image strobe durations and luminance power values including a preparatory image strobe duration and a preparatory power value~~, wherein the instructions that determine the supplemental strobe duration access the look-up table based on the average image luminance and at least one luminance power value is used to generate the supplemental strobe duration.

Claim 13 (original): The signal bearing media of claim 12, wherein the eighteenth set of machine readable instructions for generating the look-up table, include:

a nineteenth set of machine readable instructions for capturing a set of calibration images, each calibration image being associated with a predetermined calibration strobe duration, one calibration strobe duration being substantially equal to the preparatory image strobe duration; and

Attorney Docket No.: 0190131
Application Serial No.: 09/816,038

a twentieth set of machine readable instructions for generating power values corresponding to each calibration image with respect to a luminance value associated with the predetermined preparatory duration.

Claim 14 (currently amended): A digital imaging system comprising:

a processor electrically connected to a strobe;

an image sensor coupled to a memory, where a supplemental strobe duration stored in the memory is generated from a single preparatory image received at the processor from the image sensor when the strobe is activated to generate a preparatory light for a predetermined preparatory duration;

wherein the processor accesses a look-up table in the memory that stores image strobe durations and power values including a preparatory image strobe duration and an associated preparatory power value.

Claim 15 (original): The digital image system of claim 14, wherein the processor divides the preparatory image data into subsets and generates average block luminances for each subset and applies the luminance weightings to at least a subset of the average block luminances, resulting in weighted average block luminance used to derive the weighted average block luminance.

Claim 16 (original): The digital image system of claim 14, wherein the memory has a weighting table that stores the luminance weighting.

Attorney Docket No.: 0190131
Application Serial No.: 09/816,038

Claim 17 (currently amended): The digital image system of claim 14, wherein the processor ~~accesses a look-up table in the memory that stores image strobe durations and power values including a preparatory image strobe duration and an associated preparatory power value~~ generates an adjustment factor by dividing a predetermined target luminance by the average image luminance power value and then multiplying the adjustment factor by the preparatory luminance power value to derive the target luminance power value that corresponds to an identified strobe duration in the look-up table.

Claim 18 (previously presented): A method of adjusting image lighting on a preparatory image, the method comprising:

generating a preparatory light for a predetermined preparatory duration;

determining an average preparatory image luminance of the preparatory image represented by preparatory image data based on the preparatory image data and weighting at least a subset of the preparatory image data;

generating a supplemental strobe duration based on the average preparatory image luminance and luminance weightings;

generating a look-up table storing associated image strobe durations and power values including a preparatory image strobe duration and associated preparatory power value;

generating an adjustment factor by dividing a predetermined target luminance by the average image luminance;

Attorney Docket No.: 0190131
Application Serial No.: 09/816,038

multiplying the preparatory luminance power value by the adjustment factor to generate a target luminance power value; and

identifying, in the look-up table, an identified strobe duration corresponding to the target luminance power value, the identified strobe duration being the supplemental strobe duration.

Claim 19 (previously presented): A method of adjusting image lighting on a preparatory image, the method comprising:

generating a preparatory light for a predetermined preparatory duration;

determining an average preparatory image luminance of the preparatory image represented by preparatory image data based on the preparatory image data and weighting at least a subset of the preparatory image data; and

generating a supplemental strobe duration based on the average preparatory image luminance and luminance weightings, wherein generating the supplemental strobe duration further comprises

generating a look-up table storing associated image strobe durations and luminance power values including a preparatory image strobe duration and a preparatory power value;

generating a light adjustment factor by dividing a predetermined target luminance by the average image luminance;

multiplying the preparatory power value by the light adjustment factor to generate a target look-up table power value;

Attorney Docket No.: 0190131
Application Serial No.: 09/816,038

identifying, from the look-up table, first and second look-up table power values that are greater and less than, respectively, the target look-up table power value, the first and second look-up table power values having associated first and second image strobe durations; and

generating a final image strobe duration by interpolating the first and second image strobe durations in accordance with the target look-up table power value.

Claim 20 (previously presented): A method of adjusting image lighting on a preparatory image, the method comprising:

generating a preparatory light for a predetermined preparatory duration;

determining an average preparatory image luminance of the preparatory image represented by preparatory image data based on the preparatory image data and weighting at least a subset of the preparatory image data;

generating a supplemental strobe duration based on the average preparatory image luminance and luminance weightings;

generating a look-up table storing associated image strobe durations and luminance power values including a preparatory image strobe duration and a preparatory power value; and

accessing the look-up table based on the average image luminance.

Claim 21 (previously presented): A signal bearing media having machine readable instructions for adjusting image lighting on a preparatory image, the signal bearing media comprising:

Attorney Docket No.: 0190131
Application Serial No.: 09/816,038

a first set of machine readable instructions for acquiring a preparatory image;

a second set of machine readable instructions for determining an average preparatory image luminance based on preparatory image data associated with the preparatory image and weighting at least a subset of the preparatory image data;

a third set of machine readable instructions for generating a supplemental strobe duration based on the average preparatory image luminance and luminance weightings;

a fourth set of machine readable instructions for generating a look-up table that stores associated image strobe durations and power values including a preparatory image strobe duration and an associated preparatory power value;

an fifth set of machine readable instructions for multiplying the preparatory luminance power value by the adjustment factor to generate a target luminance power value; and

a sixth set of machine readable instructions for identifying, in the look-up table, an identified strobe duration corresponding to the target luminance power value, the identified strobe duration being the supplemental strobe duration.

Claim 22 (previously presented): A signal bearing media having machine readable instructions for adjusting image lighting on a preparatory image, the signal bearing media comprising:

a first set of machine readable instructions for acquiring a preparatory image;

a second set of machine readable instructions for determining an average preparatory image luminance based on preparatory image data associated with the preparatory image and weighting at least a subset of the preparatory image data;

Attorney Docket No.: 0190131
Application Serial No.: 09/816,038

a third set of machine readable instructions for generating a supplemental strobe duration based on the average preparatory image luminance and luminance weightings;

a thirteenth set of machine readable instructions for generating a look-up table that stores associated image strobe durations and luminance power values including a preparatory image strobe duration and a preparatory power value;

a fourth set of machine readable instructions for generating a light adjustment factor by dividing a predetermined target luminance by the average image luminance;

a fifth set of machine readable instructions for multiplying the preparatory power value by the light adjustment factor to generate a target look-up table power value;

a sixth set of machine readable instructions for identifying, from the look-up table, first and second look-up power values that are greater and less than, respectively, the target look-up table power value, the first and second look-up table power values having associated first and second image strobe durations; and

a seventh set of machine readable instructions for generating a final image strobe duration by interpolating the first and second image strobe durations in accordance with the target look-up table power value.

Claim 23 (previously presented): A signal bearing media having machine readable instructions for adjusting image lighting on a preparatory image, the signal bearing media comprising:

a first set of machine readable instructions for acquiring a preparatory image;

Attorney Docket No.: 0190131
Application Serial No.: 09/816,038

a second set of machine readable instructions for determining an average preparatory image luminance based on preparatory image data associated with the preparatory image and weighting at least a subset of the preparatory image data;

a third set of machine readable instructions for generating a supplemental strobe duration based on the average preparatory image luminance and luminance weightings; and

a fourth set of machine readable instructions for generating a look-up table that store associated image strobe durations and luminance power values including a preparatory image strobe duration and a preparatory power value, wherein the instructions that determine the supplemental strobe duration access the look-up table based on the average image luminance and at least one luminance power value is used to generate the supplemental strobe duration.

Claim 24 (previously presented): The signal bearing media of claim 23, wherein the fourth set of machine readable instructions for generating the look-up table, include:

a fifth set of machine readable instructions for capturing a set of calibration images, each calibration image being associated with a predetermined calibration strobe duration, one calibration strobe duration being substantially equal to the preparatory image strobe duration; and

a sixth set of machine readable instructions for generating power values corresponding to each calibration image with respect to a luminance value associated with the predetermined preparatory duration.

Claim 25 (previously presented): A digital imaging system comprising:

a processor electrically connected to a strobe; and

Attorney Docket No.: 0190131
Application Serial No.: 09/816,038

an image sensor coupled to a memory, where a supplemental strobe duration stored in the memory is generated from a preparatory image received at the processor from the image sensor when the strobe is activated to generate a preparatory light for a predetermined preparatory duration;

wherein the processor accesses a look-up table in the memory that stores image strobe durations and power values including a preparatory image strobe duration and an associated preparatory power value to generate an adjustment factor by dividing a predetermined target luminance by the average image luminance power value and then multiplying the adjustment factor by the preparatory luminance power value to derive the target luminance power value that corresponds to an identified strobe duration in the look-up table.

Claim 26 (new): The method of claim 1 wherein, the capturing captures a single preparatory image.

Claim 27 (new): The signal bearing media of claim 7, wherein the first set of machine readable instructions acquires a single preparatory image.

Claim 28 (new): The digital image system of claim 14, wherein the supplemental strobe duration stored in the memory is generated from a single preparatory image.